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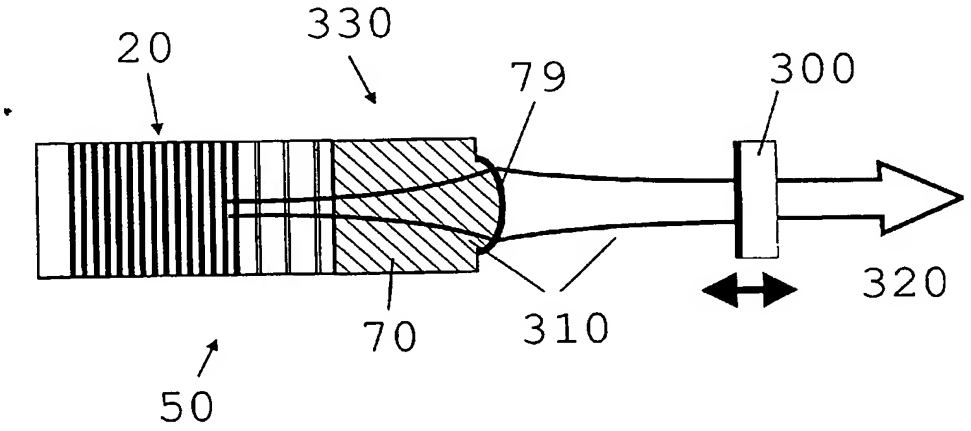
(54) Title: IMPROVEMENTS IN AND RELATING TO VERTICAL-CAVITY SEMICONDUCTOR OPTICAL DEVICES



(57) Abstract: A vertical-cavity device comprises: (a) a chip comprising an active semiconductor layer for providing optical gain; (b) a first mirror arranged on a first side of the active layer; (c) a second mirror arranged on a second side of the active layer, opposite to the first mirror, and forming with at least the first mirror an optically resonant cavity that passes through the active layer in a direction out of the plane of the active layer; (d) a heatspreader for removing heat from the active layer, the heatspreader being arranged inside the cavity and having a first surface adjacent to the chip and a second surface opposite to the first surface, the heatspreader being transparent to light of wavelengths in an operating bandwidth of the device. In addition to removing heat from the active layer, the heatspreader also has one or more further selected property that has a further selected effect on light output from the device.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01S5/183 H01S5/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HASTIE J E ET AL: "A 0.5W, 850nm AlxGa1-xAs VECSEL with intra-cavity silicon carbide heatspreader" LEOS 2002. 15TH. ANNUAL MEETING OF THE IEEE LASERS & ELECTRO-OPTICS SOCIETY. GLASCOW, SCOTLAND, NOV. 11 - 12, 2002, ANNUAL MEETING OF THE IEEE LASERS AND ELECTRO-OPTICS SOCIETY, NEW YORK, NY : IEEE, US, vol. VOL. 1 OF 2, 11 November 2002 (2002-11-11), pages 329-330, XP010620545 ISBN: 0-7803-7500-9	1-6, 10-25, 29-32
Y	the whole document	7-9, 26-28

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
12 November 2004	21/12/2004

Name and mailing address of the ISA	Authorized officer
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	EP 0 514 283 A (FUJITSU LTD) 19 November 1992 (1992-11-19) abstract; figure 4a	7-9, 26-28 1-6, 10-25, 29-32
A	ALFORD W J ET AL: "High power and good beam quality at 980 nm from a vertical external-cavity surface-emitting laser" JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B (OPTICAL PHYSICS) OPT. SOC. AMERICA USA, vol. 19, no. 4, 1 April 2002 (2002-04-01), pages 663-666, XP002305264 ISSN: 0740-3224 abstract; figure 2	1-32

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		DE 69201908 T2	03-08-1995
		EP 0514283 A2	19-11-1992
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